

## ABSTRACT OF THE DISCLOSURE

A backing plate of Ti for supporting a Ti sputtering target is formed of at least two components welded together. The backing plate is welded by interposing a Cu or Zr foil or powder between faces to be welded, and then heating the assembly to a reaction temperature high enough to melt one of the Ti and Cu or Zr to produce a liquid phase. The heating temperature is retained for a time long enough to permit diffusion of the Cu or Zr into the Ti to produce a liquid phase diffusion weld. By permitting diffusion to occur, a separate metallic compound is not produced at the welding face. In effect welding is accomplished without producing a welding face, whereby no interface exists in the finished weld. The resulting weld has a strength substantially equal to the strength of the Ti material, and very good welding qualities.